EPA Cross-Office of Research and Development (ORD) Post-Doctoral Program

Accepting Applications:
December 13, 2004 through March 31, 2005

Current Human Environmental Exposure-Effects Research and Modeling and Ecosystems Research Opportunities

EPA's Office of Research and Development (ORD) is seeking candidates to fill approximately nine federal, four-year post-doctoral research positions. Recent initiatives at ORD facilities have promoted the conduct of cross-cutting research across the different ORD Labs and Centers in the areas of human environmental exposure-effects and ecosystems. In the human health area, the overall mission for the cross-ORD post-docs will be to move forward more quickly the development and application of exposure, dose and health effects assessment methods or models. In the ecosystems research area, the cross-ORD post-docs will focus on advancing the spatial analyses methods and on their application to water quality, ecological forecasting problems, and linkages between economic drivers and landscape conditions.

Due to the broad range of ORD's research mission, we are seeking candidates from a wide range of disciplinary backgrounds, including but not limited to: biomathematics, statistics, pharmacokinetics, toxicology, physiology, biology, biochemistry, biomedical engineering, biostatistics, environmental sciences, environmental epidemiology, epidemiology, human exposure analysis, applied mathematics, chemistry, ecology, biometrics, environmental modeling, aquatic ecology, estuarine ecology, landscape ecology, geography, economics or urban planning, or related fields. The preferred candidate will have earned a Ph.D. in one of these areas within the last five years or will have it awarded prior to their Federal employment start date.

The duty station and organization will be based on the particular disciplinary focus of the candidate and the overall requirements of the program. The Cross-ORD post-doctoral positions will be in one of the following organizations: National Health & Environmental Effects Research Laboratory (NHEERL), National Center for Environmental Assessment (NCEA), National Exposure Research Laboratory (NERL), and the National Risk Management Research Laboratory (NRMRL). Duty stations associated with these organizations are: Research Triangle Park, NC, Cincinnati, OH, Las Vegas, NV, Washington, DC, Athens, GA, and Corvallis, OR.

Applicants must be United States citizens or permanent residents. Only in the absence of qualified U.S. citizens will permanent residents who are citizens of countries specified as exceptions to the appropriations act ban on paying non-U.S. citizens be considered. Further information on Federal employment of non-citizens is available at http://www.opm.gov/employ/html/citizen.htm.

Excellent Federal employee benefits:

- Salary range of $48,947 to $76,261
- Full four-year appointments
- Paid relocation to EPA duty location
- Vacation and sick leave
- Federal health benefits, life insurance, and retirement program
- Travel to professional and scientific meetings

Easy application process:

- Up-to-date Curriculum Vitae
- Letter of recommendation from your research advisor or comparable official
- Cover letter indicating positions and locations of interest, your email address, U.S. citizenship status, and how you learned of this program
- DD-214, if claiming veteran's preference
- See "Application Instructions" (below) for where to send the above application materials
- See "ORD Lab and Office Locations" at http://www.epa.gov/ord/htm/map.htm for information on specific locations and Laboratories and Centers.

For further information, contact Dorothy Carr at carr.dorothy@epa.gov.

Current Project Openings

Below is a list of projects for which there are currently openings. Specific details on each of these projects are provided on pages 4-12.

Federal Human Environmental Exposure-Effects Research Openings
PBPK Modeling of Exposure-Dose-Response Linkages
Computational Toxicology and Toxicogenomics
Application of Exposure Analysis Tools in Environmental Epidemiology
Assessing Environmental Exposures and Health Implications in Aging Population
Chemical-Specific Risk Assessments

Federal Ecosystems Research Openings
Forecasting Vulnerability of Ecological Resources
Development and Application of Spatial Statistical Models
Spatial Prediction of Biological Conditions in Aquatic Ecosystems
Development of Relationships between Water Quality, Water Quantity, and Economic Factors

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Application Instructions

All application materials must be received at the address below or postmarked by March 31, 2005.

Mail your application materials to:

US EPA, HRMD-C639-02
Attn: Ms. Dorothy Carr, Cross-ORD Post Doctoral Program
4930 Page Road
Research Triangle Park, NC 27711

For express courier, send to:

Attn: Ms. Dorothy Carr, Cross-ORD Post Doctoral Program
Mail Drop C639-02
HRMD/Suite C 635
4930 Page Road
Durham, NC 27703

OR FAX to (919) 541-2186. Note, applications faxed from a U.S. government fax machine will not be accepted. Applications sent electronically via the Internet or mailed in U.S. government postage-paid envelopes will also not receive consideration.

If you have questions, contact Ms. Dorothy Carr at (919) 541-4356 or email carr.dorothy@epa.gov.

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Project Number:	ORD-2005-01
Sponsoring Lab or Centers:	NHEERL; NERL; NCEA
Location of Position:	Research Triangle Park; Cincinnati, OH; Las Vegas, NV; Washington, DC
Research Area:	PBPK Modeling of Exposure-Dose-Response Linkages
Brief Description of Research Projects:	Pharmacokinetic modeling is a valuable tool for linking effects with exposures to individual chemicals or mixtures. Route-to-route and interspecies extrapolations as well as describing human population variability are major ongoing research areas: 1) Route extrapolation is important to improve utilization of toxicity testing data in support of current regulatory activity such as air toxics research. Oral-to-dermal extrapolation is particularly important for pesticides. 2) Modeling pharmacokinetics of early life stages is important for improving risk assessment. This is a focus in NHEERL for improved extrapolation of 1- or 2-generation reproductive toxicity study outcomes to humans by assessing exposure and internal dose to the mother, fetus, nursing pups, and weaned juvenile for comparison with human doses. 3) PBPK modeling of simple, defined chemical mixtures (e.g., pesticide mixtures, drinking water disinfection by-products, air toxics) to estimate tissue doses from dermal, oral and inhalation exposure routes for use in cumulative risk assessment.
Educational Requirements:	Ph.D. in biomathematics, statistics, pharmacokinetics, toxicology, physiology or related disciplines
Specialized training and/or experience preferred:	Pharmacokinetics and other biologically-based modeling, pharmacokinetic experimental methods, toxicology of chemical mixtures, application of modeling to risk assessment
Scientific Contact/Principal Investigator*	Name: Hugh Barton, Haluk Ozkaynak, or Jerry Blancato Email: Barton.Hugh@epa.gov, Ozkaynak.Haluk@epa.gov, Blancato.Jerry@epa.gov

*This person may be contacted for additional scientific information about this project. This person is **not authorized** to accept applications, make job offers, set salaries, establish start dates or discuss benefits. See general announcement for details on how to apply.

Project Number:	ORD-2005-02
Sponsoring Lab or Centers:	NHEERL; NERL; NCEA
Location of Position:	Research Triangle Park, NC
Research Area:	Computational Toxicology and Toxicogenomics Research
Brief Description of Research Projects:	The goal of research in the emerging field of Computational Toxicology (CT) is to integrate modern computing and informational technologies and the technologies of molecular biology and chemistry in order to improve EPA's prioritization of data requirements and risk assessments for toxic chemicals including those that may adversely impact human health. There are a number of the 14 pre-proposals currently under development in the CompTox "New Start" RFA that are devoted to improving predictive linkages in the source to outcome paradigm. General areas of interest for the CT research projects, include: • monitoring of exposure to mixtures of stressors using molecular diagnostic indicators of possible adverse human health • predicting the outcome of cellular metabolism of xenobiotics and the pathogenicity of microorganisms • developing and applying computational chemistry tools • understanding and modeling chemical source/stressor formation, transport and transformation, environmental characterization, exposure, dose, early biological effects, altered structure/function, disease • modeling of biologically relevant biotransformation processes in the environment and physiologically-based pharmacokinetic processes within organisms • generating molecular signatures for toxicant classes, and identifying and facilitating the structural characterization of exposure-specific genes
Educational Requirements:	Ph.D. in biology, biochemistry, physiology, biomedical engineering, toxicology or related disciplines
Specialized training and/or experience preferred:	Statistics, computer modeling, bioinformatics. toxicogenomic experience, including data mining and bioinformatics, linking genomics to either exposures or outcomes in humans or experimental lab animals
Scientific Contact/Principal Investigator*	Name: Robert Kavlock or Jerry Blancato Email: Kavlock.Robert@epa.gov, Blancato.Jerry@epa.gov

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Project Number:	ORD-2005-03
Sponsoring Lab or Centers:	NERL or NHEERL
Location of Position:	Research Triangle Park, NC
Research Area:	Application of Exposure Analysis Tools in Environmental Epidemiology
Brief Description of Research Projects:	1) Develop new improved methods for estimating personal exposures to study subjects in El Paso, TX and later in Detroit to be recruited by NERL and NHEERL. Research will combine GIS tools with emissions, transportation, demographic, etc. for estimating exposures to individuals or populations in these locations, and possibly in Ciudad Juarez, Mexico. Collaborate in the investigation of health effects associated with exposures to PM and air toxics in El Paso and in Detroit. 2) Develop and apply source-to-dose models for the locations and populations studied by NHEERL in Utah and Nevada. Research will include refining and testing concentration-to-dose models developed by NERL that predict urinary arsenic metabolite levels, and applying these models for predicting aggregate arsenic exposures of individuals from various sources and media, in the analysis of health effects, where arsenic levels have been measured. 3) Application of GIS-based exposure analysis tools in computational toxicology field projects
Educational Requirements:	Ph.D. in biostatistics, environmental sciences, environmental, epidemiology or related disciplines
Specialized training and/or experience preferred:	GIS analysis, air pollution epidemiology, exposure modeling, risk analysis
Scientific Contact/Principal Investigator*	Name: Haluk Ozkaynak or Lucas Neas Email: Ozkaynak.Haluk@epa.gov, Neas.Lucas@epa.gov

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Project Number:	ORD-2005-04
Sponsoring Lab or Centers:	NCEA; NERL; NHEERL
Location of Position:	Washington, DC or Research Triangle Park, NC
Research Area:	Assessing Environmental Exposures and Health Implications in Aging Population
Brief Description of Research Projects:	Older adults represent one of the fastest growing demographic units in the United States. Their exposure to environmental contaminants is most likely different than the exposure of the general population due to, for example, differences in activity patterns, diet, health status, lifestyle, and socio-economic status. The main focus of this research area is better characterization of exposure for older adults. Another focus is to better understand the pharmacokinetics and pharmacodynamics of chemical exposures from different routes in the aging populations (included also under the PBPK modeling research area). Two projects are being considered under this research theme: 1) The first project is intended to characterize the exposure of older populations to environmental contaminants. This project can be approached in several ways. For example, one focus might be on how activity patterns and microenvironments of older adults impact exposure and how these vary with health status or residential situation. For instance, exposure for those in owner-occupied homes is likely to be different than for those in institutional care settings. Another focus may be on diet. 2) The second project will involve pharmacokinetic and/or pharmacodynamics modeling for the aging populations and consideration of how commonly used pharmaceuticals, specialized activities and micro activities, and diet, etc., may impact the uptake, metabolism, and impact of environmental contaminants.
Educational Requirements:	Ph.D. in toxicology, epidemiology, physiology, exposure, applied mathematics or related disciplines
Specialized training and/or experience preferred:	Pharmacokinetics, PBPK Modeling, and experience with working in an inter-disciplinary environment
Scientific Contact/Principal Investigator*	Name: Jackie Moya or Andrew Geller Email: Moya.Jacqueline@epa.gov, Geller.Andrew@epa.gov

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Project Number:	ORD-2005-05
Sponsoring Lab or Centers:	NERL; NCEA; NHEERL; NRMRL
Location of Position:	Research Triangle Park, NC; Athens, GA; Cincinnati, OH
Research Area:	Chemical-Specific Risk Assessments
Brief Description of Research Projects:	1) Sources, Pathways of Formation, Fate and Effects of Perfluoronated Organics: Certain perfluoronated chemicals (e.g., PFOA, PFOS, etc.) are of keen interest both to the regulatory and the scientific communities because of their widespread occurrence, persistence in the bodies of humans and wildlife, and potential for developmental and reproductive toxicity. Several key questions in the source-to-effects continuum must be answered before risk from these chemicals can be assessed accurately. For example, the sources of these chemicals must be determined. This includes direct release and also environmental transformation of precursor chemicals that may have the potential for long-range transport. There is also a need for understanding the potential for metabolism of precursor chemicals and developing dose-response profiles and pharmacokinetic models. Finally, the toxic mode of action must be better understood. These toxicity pathways and mechanisms will be probed by 'omic techniques (genomics, proteomics, and metabonomics), to later screen for indicators of toxicity. 2) Development of human health risks from exposures to drinking water disinfection by-products (DBPs) using data from the 4-Lab study Analysis of toxicological data and analytical chemistry data resulting from the 4-Lab study (NHEERL, NCEA, NERL and NRMRL) on complex mixtures of drinking water DBPs. Use data from this study to predict potential human health risks for several endpoints (e.g., reproductive and developmental effects, mutagenecity, cancer, neurotoxicity). Trial run data already available; full study data scheduled to be collected in 2005.
Educational Requirements:	Ph.D. in chemistry, biochemistry, toxicology, biostatistics or related disciplines
Specialized training and/or experience preferred:	Chemical transformation, metabolism, toxicogenomics, toxicological data analysis, modeling, risk analysis, research on complex mixtures
Scientific Contact/Principal Investigator*	Name: Tim Collette or Linda Teuschler Email: Collette.Tim@epa.gov, Teuschler.Linda@epa.gov

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Project Number:	ORD-2005-006
Sponsoring Lab or Centers:	NERL; NHEERL; NRMRL; NCEA
Location of Position:	Las Vegas, NV; Research Triangle Park, NC; Cincinnati, OH; Washington, DC
Research Area:	Forecasting Vulnerability of Ecological Resources
Brief Description of Research Projects:	The development of linkages for in-situ monitoring, spatially continuous biophysical data derived from remote sensing and other sources, with models to forecast short-term (months to a few years) vulnerability of ecological resources to hazardous conditions is important to a proactive protection of endangered resources. Examples include the ability to forecast (1) the spread of invasive species and diseases, (2) the outbreak of pests and pathogens that damage forests, crops, commercially important biological species, and indigenous biological communities, (3) the outbreak of pathogens that threaten drinking water supplies, and (4) the spatial distribution of extreme environmental events that effect ecosystem sustainability, biological diversity, and human life and property. The EPA/ORD currently has a range of ecosystem monitoring and modeling efforts, including EMAP and ReVA, that would facilitate the development of an ecological forecasting framework. This project also builds upon existing experience and research in alternative futures analysis (NHEERL WED), vulnerability assessments (NERL ESD), and the development of bioendgineered crop monitoring tools (NRMRL) but would fill a gap in shorter-term forecasting capabilities. Many of ORD's programs have spatial analysis implications, and as such this research represents a cross-cut for ORD laboratories and centers.
Educational Requirements:	Ph.D. in ecology, biometrics, environmental modeling or related disciplines
Specialized training and/or experience preferred:	Ecological process modeling, GIS, Statistics
Scientific Contact/Principal Investigator*	Name: K. Bruce Jones Email: jones.bruce@epa.gov

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Project Number:	ORD-2005-07
Sponsoring Lab or Centers:	NHEERL or NERL
Location of Position:	Research Triangle Park, NC; Las Vegas, NV; or Corvallis, OR
Research Area:	Development and Application of Spatial Statistical Models
Brief Description of Research Projects:	Research objective is collaborative development and application of spatial statistical models to environmental applications. Areas of interest are spatial prediction and near-term forecasting of aquatic ecosystem biological condition, investigating models that combine environmental data from multiple scales. Specific applications will depend on development of collaborative studies with USEPA researchers.
Educational Requirements:	Ph.D. in statistics or related disciplines
Specialized training and/or experience preferred:	Requires background in spatial statistical modeling with experience in application of geostatistical models and Bayesian spatial hierarchical modeling.
Scientific Contact/Principal Investigator*	Name: Bruce Jones, James Wickham, or Tony Olsen Email: Jones.Bruce@epa.gov, Wickham.James@epa.gov, Olsen.Tony@epa.gov

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Project Number:	ORD-2005-08
Sponsoring Lab or Centers:	NHEERL or NERL
Location of Position:	Research Triangle Park, NC; Las Vegas, NV; or Corvallis, OR
Research Area:	Spatial Prediction of Biological Conditions in Aquatic Ecosystems
Brief Description of Research Projects:	Research objective is spatial prediction of biological conditions in aquatic ecosystems (fresh water and estuarine) at multiple scales. The primary aim is to extend estimates of biological conditions derived from field sampling to areas not sampled. The research builds upon and pulls together ongoing research in ORD to establish linkages and models that relate biological conditions in freshwater and saltwater ecosystems to environmental conditions at a range of scales in different biophysical settings. This research would take advantage of EMAP, USGS, and other in-situ data, as well as remote sensing and other spatial data. Models resulting from this research could be used (1) to improve estimates of the biological condition of aquatic resources, (2) to improve monitoring programs by focusing monitoring efforts, and (3) to evaluate spatially explicit options to reduce risks and vulnerability. Initial project activity would focus on synthesizing current research studies and methodologies to produce a state-of-the-science assessment identifying strengths and weaknesses of current research. Research would develop models that incorporate spatial correlation and integration of multi-scale data.
Educational Requirements:	Ph.D. in aquatic ecology, estuarine ecology, landscape ecology, geography, statistics or related disciplines
Specialized training and/or experience preferred:	Requires strong skills and experience in spatial analysis in GIS and statistics. Skills in semi-empirical modeling using field and complete coverage information (such as GIS coverages). Knowledge of aquatic ecosystems or landscape ecology preferred.
Scientific Contact/Principal Investigator*	Name: Bruce Jones, James Wickham, or Tony Olsen Email: Jones.Bruce@epa.gov, Wickham.James@epa.gov or Olsen.Tony@epa.gov

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Project Number:	ORD-2005-09
Sponsoring Lab or Centers:	NERL or NRMRL
Location of Position:	Research Triangle Park, NC; Cincinnati, OH
Research Area:	Development of Relationships between Water Quality, Water Quantity, and Economic Factors
Brief Description of Research Projects:	Economic value of environmental amenities continues to be a growing research area. Land quality is commonly used as a factor to study land use transition, including loss of forest and conversion to residential use. Anecdotal evidence and the continued increase in the nation's water quality and quantity problems suggest that water quality should also be a determinant of land value and likely projected uses. Yet, documentation of relationships between economic factors and water quality and quantity are less well known. Documentation of relationships between water quality and economic factors would provide support to the Clean Water Act. An important outcome of the post-doctoral would be a strategic assessment of the specific areas for productive research between economic factors and water quality and water quantity. Project would include: (1) Thorough literature review of Economic - Water Quality and Quantity relationships, (2) Assessment of relationships between land value and lake water quality, (3) Assessment of relationships between land value and watershed conditions, and (4) an economic and effectiveness assessment of BMPs at watershed scales.
Educational Requirements:	Ph.D. in ecology, geography, economics, urban planning with a strong background in water quality analysis or related disciplines
Specialized training and/or experience preferred:	Strong background in multivariate statistics, mathematical modeling, economic geography, location theory, water quality, and nutrient trading
Scientific Contact/Principal Investigator*	Name: James Wickham or Hale Thurston Email: Wickham.James@epa.gov, Thurston.Hale@epa.gov

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